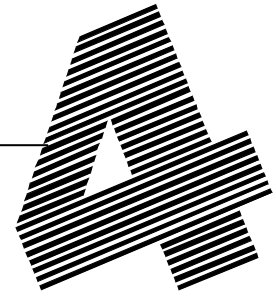


TeamFour

A R C H I T E C T S

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Meeting Notes

| | |
|-------------------------|---|
| Date: | October 15, 2009 |
| Project: | GSA - WO #70 RAY ARRA Wind and PV Feasibility Study RAY Federal Building |
| Project Numbers: | GSA Project #: IMO 00090 Team Four Project #: 29028.00 |
| Purpose: | 95% Report Presentation Meeting |
| Date of Meeting: | October 13, 2009 |
| Location: | Robert A. Young Federal Building, GSA Conference Room |
| Participants: | GSA Denise Ryerkerk, Project Manager Bob Minor (via phone) Tom Yochim, Property Manager Charlie Meyer, Field Office Director Mark Martinez, Construction Representative Chris Cockrill (via phone) Mike Thomas (via phone) John Nelson (via phone) Ken Hollingsworth (via phone) Gary Adams (via phone) Matt Varga (via phone) Dirk Meyer (via phone) William Holley (via phone) |
| | Team Four/Saur Bruce Hesterberg, Principal |
| | Hellmuth+Bicknese Dan Hellmuth Patrick Ladendecker |
| | EDM Gary Neuhaus Roger Hagemann Ted Bergen |
| Distribution: | All Participants Linda Phillips, GSA Jason Ide, Jacobs Mike Scarborough, GSA Vickie Ford, GSA Dave Hartshorn Glen Essink |

John Sonderman – EDM
Bob Warren - EDM
Wanda Evans – Hellmuth + Bicknese
Martha Pivinski – Team Four/Saur
Mike Vuagniaux – Jacobs

Introduction

1. The purpose of the meeting was to present the 95% report on the Feasibility Study for wind turbines, photovoltaic systems and other possible renewable energy sources for the RAY Building.

Wind and Photovoltaic Energy Options

2. Dan Hellmuth presented the report in its entirety. Comments and discussion included the following items.
3. The penthouse roof structure over the air handler units is not known at this time. Shop drawings are required on this to see the structure. **Action by GSA.**
4. The rebar in the concrete roof deck is not known. It can not be discerned from the original drawings that are available. Ultrasound and Ground Penetrating Radar can locate the spacing of the rebar but can not identify the size of the rebar. There is a book that has the minimum reinforcing requirements of the building code at that time. This would give some additional insight into the structures capacity. EDM is trying to locate this book. **Action by EDM.**
5. The live load reserve capacities on the roofs are adequate to address the additional loads of the PV systems. The uplift calculations have been taken into account with 18 – 30 lb/sf loads, 30 lbs/sf at the corner/edge and 18 lbs/sf in the field.
6. Charlie mentioned that it would be desirable to have the loading capacity for each of the roof areas indicated if this can be determined. **Action by EDM/H+B.**
7. Window washing is done once or twice a year. Stages are used for maintenance from time to time but not used for window washing. The window washing space requirements have been taken into account in the PV layout.
8. Periodic cleaning of PV modules would be required.
9. Some unknowns exist about how some PV units might adhere to the existing roof coating.
10. Ice shields could be added to canopy units to deal with snow and ice build up.
11. Cooling tower replacement is not far off and this requires a significant amount of free area to work around the cooling towers. This could be an issue with PV installed near by.
12. The spray from the cooling towers will fall on PV panels installed close by. This water is chemically treated. This needs to be investigated and considered in the layout.
13. The meters are in the basement. Low voltage shunt trips might be used.
14. The maintenance on electrical equipment should be factored into the life cycle costs as well.
15. The report shows three gradations of shading on the roof. This corresponds to areas that are shaded for 1 hour, 2 hours and 3 hours or more. This will called out in the report with a legend.
16. The report references products made in the USA. The Buy American Agreement includes Mexico and Canada and other countries. Products need to conform to the Buy American Agreement.

17. The field office sees façade mounted canopy panels as problematic for the following reasons:
 - a. Additional window cleaning cost
 - b. Impacts on views
 - c. Maintenance impacts
 - d. Rigging impacts
 - e. Snow and ice issues
 - f. Maintenance and cleaning of the PV canopies
 - g. Additional window washing
 - h. Penetrations in the masonry to anchor the canopies and
 - i. Aesthetic impacts with the exposed conduits interconnecting the canopies.
18. It was questioned whether the proposed location for the heat inverters would be problematic because of the heat build up in the rooms. The heat inverters would not have an issue with the anticipated temperatures.
19. There are some concerns with maintenance issues on the vertical axis wind turbines. The product selected is braced at the top and bottom to limit vibration.
20. The system would generate about 200 kw with an additional 40 – 60 kw if canopies were installed on the south face. The payback period for the PV appears to be less than 40 years without factoring incentives. The pay back on the wind turbines is about 120 years.
21. The costs need to be separated for each system: PV type 1, PV type 2 and Wind. Each system needs to have its own calculation of pay back. This should show the s.f. of rack mounted panels and the s.f. of BIPV thin film.
22. A conference call will be scheduled during the week of 10/26 to allow further discussion of the information in the report. **Action by GSA.**
23. A CD of the presentation needs to be sent to Denise along with the hard copies of the report. **Action by Team Four.**
24. Team Four/Saur and Hellmuth+Bicknese will get together with Tom Yochim to discuss the report in more detail. (Subsequent to the meeting this has been set up for 9:00 am on 10/20.

This is my record of the decisions and discussion at this meeting. Please respond within seven days with any additions or corrections. Following that time, this document will reflect the actions and decisions of the meeting.

Respectfully,

Bruce L. Hesterberg, AIA, Principal/Project Manager

Attachments: Sign-in Sheets
Agenda

Introductions

Review of 95% Report

Existing Conditions

1 Existing Roof/Penthouses

2 Parapets

3 Drainage

4 Code and Life Safety Issues

5 Historic Consideration

6 Structural Conditions

PV/Wind Feasibility Analysis

7 Renewable Energy Evaluation

8 Building Maintenance

9 Roof Warranty

10 Window Washing

11 Electrical, Mechanical and Structural Evaluation

Approach to PV/Wind

12 Layout

13 Recommended Systems

14 Performance Monitoring

15 Mechanical Evaluation

16 Electrical Concept

17 Structural Layout

18 Incentives

19 Payback Analysis

20 Total Cost

21 Application in LEED-NC

22 Recommendations

Other Discussion Items

Next Steps / Schedule Confirmation

Oct 13

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95% Report Review Meeting
 Conference Call for Add'l Comments
 Receipt of Final Report

RAY ARRA

Wind and PV Feasibility Study

WO #70 / Project # IMO00090

Sign-in Sheet

Meeting Title: 95% Review Presentation

Date: October 13, 2009

Location: RAY Building

